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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT: THADDEUS SCHROEDER et al)
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) Group Art Unit:
SERIAL NUMBER 09/663,030)
) 3611
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FILED: September 15, 2000)
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FOR: PIEZORESISTIVE TORQUE SENSOR)

REPLY BRIEF

The Examiner has responded to Appellants' arguments by stating that Claim 1 "does not require that the sensor occupies the entire length of the slot." (*Answer*, pg. 4, 6).

Appellants respectfully disagree with the Examiner's characterization of that requirement of Claim 1. In fact, Claim 1 *does* require that the sensor occupy the entire length of the slot. This fact is made evident by the very wording in Claim 1, namely: "a piezoresistive sensor positioned within **and along the length of the slot...**[emphasis added]." This limitation is simply not taught or suggested in Taig. In fact, Taig specifically *teaches away* from such positioning of his sensor. This "teaching away" by Taig returns us to the so called "void area" of Taig. To that end, the Board's attention is again directed to Figure 2 of Taig where torsion member 20 "is elongated, and flat **with a central portion 66 of reduced lateral dimension** [emphasis added]." (*Col. 3, lines 45 – 47*). This central portion of torsion member 20, which has a reduced lateral dimension, defines the so called "void area" area parallel to the axis 82 and located between the tabs designated by the reference numerals 70 and 74. It is reiterated that, upon assembly of the arrangement shown in Figure 2 of Taig, the "void area" is located coincident with the periphery of the shaft that makes up the input member 16. However, the "void area" is *just* that area, or location, in which the sensor of Claim 1 of the present application is in fact found. This is clearly seen in Figures 14A – 14D of the application as filed. Thus, even if

tabs 70 and 74 of Taig are displaced with respect to one another in response to an applied torque, Taig teaches that there is no material between these tabs due to the “**reduced lateral dimension** [emphasis added].” (*Col. 3, lines 45 – 47*). In other words, there is simply nothing in this “void area” to *act as a sensor nor be responsive as a cantilever beam* as required by Claim 1.

This brings us to the Examiner’s considering “the strain gauge 94, together with the torsion member 20, of Taig to comprise the “sensor” as claimed,” and that “these elements are also responsive as cantilever beams, when this recitation is given its broadest reasonable interpretation.” (*Answer, pg. 4,5*). But the Examiner’s “broadest reasonable interpretation” of the sensor of Taig contradicts what is specifically taught by Taig, namely: a torsion member 20 “**with a central portion 66 of reduced lateral dimension**” that results in a void area where it is physically impossible for the sensor of Taig to *act as a sensor or be responsive as a cantilever beam* as required by Claim 1. Thus, the Examiner’s further assertion that “along *any longitudinal axis* of the strain gauge 94 and member 20, which is *parallel to, and laterally spaced from, the central axis 82*, the strain gauge 94 and member 20 are inherently responsive as cantilever beams when torsion occurs,” is also erroneous because Claim 1 requires that the sensor be located in a slot located at the periphery of the shaft. But the void area, as taught by Taig, is located at just that location. Thus, the sensor of Taig is physically incapable of *acting as a sensor or being responsive as a cantilever beam at that location* as required by Claim 1.

Still further, the Appellants would like to point out that, the sensor of Claim 1 of the present application is a cantilever beam undergoing **bending**. Thus, by definition the phrase “responsive as a cantilever beam” in Claim 1 means responsive as “a member with one end projecting beyond the point of support, free to move in a vertical plane under the influence of vertical loads placed between the free end and the support.” (*see Appendix C of Appeal Brief; Handbook of Engineering Fundamentals, O. W. Eshbach and M. Souders , Ed., John Wiley & Sons, 3rd Ed. 1975*).

In stark contrast, it is pointed out that, as the Examiner agrees, “the sensor of Taig is under **torsion** [emphasis added].” (*Answer, pg. 5*). This fact is also clearly made evident by the description of the invention. (*Col. 3, l. 4 - Col. 4, l. 61*). Thus, the measurement of

bending in Claim 1 of the present application cannot read upon the measurement torsion in Taig.

Yet further, it is noted that Claim 1 of the present application requires a piezoresistive sensor positioned in a slot located at “a single” peripheral location about the surface of a shaft. Taig clearly discloses two slots 76 diametrically opposed about the shaft 16. However, the sensor of Taig clearly **cannot function** without the presence of **both** slots 76. In particular, the four tabs or ears 72, 74 seen in Figure 2 of Taig **must** be engaged within **both** slots in order to respond in torsion to an applied torque. (*Col. 3, l. 4 – Col. 4, l. 62*). The sensor of Taig cannot respond in torsion in the slot of the present invention because there is no mechanism by which to accommodate the four tabs 72, 74 and generate the necessary torsion in the sensor. Thus, the “slot … located at a single peripheral location about the surface of the shaft” does not read upon the disclosure of the two slots in Taig.

Thus, based upon the foregoing analysis, it must be seen that Taig is missing an element of Claim 1, namely *a piezoresistive sensor positioned within and along the length of the slot and responsive as a cantilever beam to torque applied to the shaft and operative thereby to provide as output a signal indicative of the applied torque*. Therefore, Taig cannot anticipate Claim 1 of the present invention.

For the reasons cited above, and for the additional reasons set forth in the Appeal Brief, Appellants respectfully submit that the Examiner's rejection of Claims 1 - 9 are improper and that this application is in condition for allowance. Appellants request reversal of the outstanding rejections and early allowance of this application. If there are any additional charges with respect to this Appeal or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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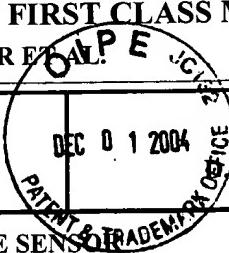
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